(54) Title: METHOD IN CONNECTION WITH A REEL-UP OF A FIBRE-WEB MACHINE

(57) Abstract:
The invention relates to a method in connection with a change process of a reel-up of a fibre-web machine, which method is applied when performing a change of reeling of a web (W) from a web roll (11) being completed to a new web roll for reeling the
(57) **Abstract (continued):**

next roll around a reeling shaft (12). In the method, for fastening the surface layer of the web roll (11) to the web roll (11) being completed, at least one two-sided tape (20) is adhered from its one side to the web (W) being passed to the web roll (11) being completed or to the surface of the web roll (11) and said tape (20) is adhered from its other side to the surface of the web roll (11) being completed/to the surface of the web (W) being reeled onto the web roll (11) being completed due to the effect of a reeling nip between the reel drum (13) and the web roll (11) or a pressing-roll nip between the web roll (11) and a pressing roll (14) or due to the effect of the tightness (T) of the web.
Abstract: The invention relates to a method in connection with a change process of a reel-up of a fibre-web machine, which method is applied when performing a change of reeling of a web (W) from a web roll (11) being completed to a new web roll for reeling the next roll around a reeling shaft (12). In the method, for fastening the surface layer/surface layers of the web roll (11) to the web roll (11) being completed, at least one two-sided tape (20) is adhered from its one side to the web (W) being passed to the web roll (11) being completed or to the surface of the web roll (11) and said tape (20) is adhered from its other side to the surface of the web roll (11) being completed to the surface of the web (W) being reeled onto the web roll (11) being completed due to the effect of a reeling nip between the reel drum (13) and the web roll (11) or a pressing-roll nip between the web roll (11) and a pressing roll (14) or due to the effect of the tightness (T) of the web.
Arrangements are also known from prior art which have been applied in connection with the manufacture of e.g. coated fibre-web types and in which, for holding the surface layers of the completed machine roll fast, problem-solutions based on the effect of water have been developed for improving the hold between the surface layers. In these known arrangements, water is sprayed between the surface layers by means of feed pipes or the like. Such arrangements have, however, proved problematic, because water does not bind the surface layers tightly enough, whereby the surface layers of the roll have become loose.

Also arrangements are known from prior art based on the effect of different surface binding materials, such as glue, for improving the hold between the surface layers. In arrangements known from prior art, a case-specifically suitable amount of surface binding material is sprayed on the material being reeled in such a position in relation to the roll being completed and the reeling nip that the surface binding material has time to act i.e., there is a delay after spraying the surface binding material before the pressing caused by the nip, whereby a hold between the layers is obtained. In arrangements known from prior art, in such cases, a feed pipe/pipes of the surface binding material is/are used as the apparatus, in which pipe/pipes there are one or more nozzles according to the position of the apparatus. A problem of these arrangements known from prior art has proved to be that the surface binding material can accumulate and dry up in the nozzles of the feed pipe causing their clogging.

The object of the invention is to eliminate or at least minimise problems and disadvantages of the afore-described arrangements known from prior art.

An object of the invention is to provide a method in connection with a reel-up of a fibre-web machine, in which method the surface layers of a completed machine roll will not be able to become loosened during braking and stopping.
Document WO 2004/046006 shows a rewinding machine comprising three winding rolls to wind a web material and form logs and a first glue dispenser to apply glue to a portion of the web material, in proximity to a severing line, along which the web is severed upon termination of winding a log. The first glue dispenser comprises a mechanical element that touches the web material upon termination of winding each log to transfer the glue to the web material. The tail of the web is fastened with said glue to the outer surface of the log. The possibility of using double-sided tape instead of glue to fasten the tail of the web to the outer surface of the log is also mentioned in this document. This document does not, however, contain any further details of how the two-side tape could be applied to the web material. This document forms the closest prior art to our invention.
inside the roll weaken the quality of the roll, cause production losses and are thus particularly problematic.

Furthermore, problems are caused by "flying pieces" i.e. pieces of fibre web i.e. surface broke separates from the tail of the machine roll i.e. end of the web on the surface of the roll when the tail hits against the pressing device when braking the machine roll after the change. This problem becomes particularly disadvantageous if pieces of fibre web fly with air flows caused by the surface of the machine roll into the machine roll being at the start of a new reeling. The pieces of fibre web inside the machine roll cause a break risk in the later handling of the roll and can in connection with calendering even damage the rolls of the calender when entering into the calendering nip between the rolls of the calender.

The afore-described occurrence of web pieces in connection with reeling is many times thus called in the art the creation of surface broke and the separated web pieces being produced are called surface broke. Primary surface broke means such web shreds/loose web pieces as are created in the primary drive in connection with the change cutting or after that mostly caused by change blowings etc. Secondary surface broke means web shreds which fly into the air in the secondary drive after the change from the surface of a still rotating completed roll caused e.g. by the flapping of the web tail or by the breaking of its surface. Some objects of the present invention are related to solving problems mostly caused by secondary surface broke.

A problem in connection with the change process in a reel-up has been that after the change the surface layers of a completed machine roll loosen when braking the machine roll and after stopping when removing a pressing device from its position against the roll. The loosening of surface layers causes surface broke and the situation is at its worst in connection with fast, speed over 1,500 m/s m/min, on-line machines especially when reeling slippery fibre-web types, such as LWC and CWF, whereby even over 1,000 metres of surface broke can be created.
In traditional continuous reel-ups known from prior art, there has usually been no need to bind the surface of the machine roll to the surface of the roll immediately after the change of the machine roll, especially if the running speed has been low and the material being reeled has been permeable to air and has had a high friction coefficient between the fibre-web layers. If a charge is created in the web being reeled before the reeling process as a result of static electricity, the hold between the layers improves and the surface layers of the roll remain attached to the completed machine roll. The charge phenomenon occurs especially when reeling a dry fibre web. A charge can also be created by design by means of a separate apparatus for binding surface layers in the completed roll. A problem in situations in which the surface layers of the web roll are held fast in the completed roll by means of a high charge is that the high charge can impede working, e.g. sampling close to the machine, because charges can discharge from the roll via the operating personnel into the machine frame or the building in an unpleasant or dangerous manner.

A method is also known from prior art for holding the surface layers fast in the completed machine roll by means of a pressing device, such as a brush or a roll, by which brush or roll the surface of the machine roll is pressed during the changing and stopping of the machine roll, whereby a nip formed between the completed machine roll and the brush or the roll prevents air from entering into the machine roll and keeps the surface layers of the machine roll in place. A disadvantage of these known arrangements is the cost accrued by the pressing device e.g. a brush or a roll, the marking of the web and the space requirements of the devices. When using high running speeds, the tail of the web further hits the pressing device on every revolution, whereby small pieces are torn off from the tail of the web which cause afore-described problems and more cleaning requirements and thus more stays of the operator in the area of the reel-up during running, which causes a safety risk. Additionally, cleaning requirement increases the requirement for the use of compressed air.
Arrangements are also known from prior art which have been applied in connection with the manufacture of e.g. coated fibre-web types and in which, for holding the surface layers of the completed machine roll fast, problem-solutions based on the effect of water have been developed for improving the hold between the surface layers. In these known arrangements, water is sprayed between the surface layers by means of feed pipes or the like. Such arrangements have, however, proved problematic, because water does not bind the surface layers tightly enough, whereby the surface layers of the roll have become loose.

Also arrangements are known from prior art based on the effect of different surface binding materials, such as glue, for improving the hold between the surface layers. In arrangements known from prior art, a case-specifically suitable amount of surface binding material is sprayed on the material being reeled in such a position in relation to the roll being completed and the reeling nip that the surface binding material has time to act i.e. there is a delay after spraying the surface binding material before the pressing caused by the nip, whereby a hold between the layers is obtained. In arrangements known from prior art, in such cases, a feed pipe/pipes of the surface binding material is/are used as the apparatus, in which pipe/pipes there are one or more nozzles according to the position of the apparatus. A problem of these arrangements known from prior art has proved to be that the surface binding material can accumulate and dry up in the nozzles of the feed pipe causing their clogging.

The object of the invention is to eliminate or at least minimise problems and disadvantages of the afore-described arrangements known from prior art.

An object of the invention is to provide a method in connection with a reel-up of a fibre-web machine, in which method the surface layers of a completed machine roll will not be able to become loosened during braking and stopping.
An object of the invention is to provide a method in connection with a reel-up of a fibre-web machine in which, during the change process, no floating separated web pieces occur in a detrimental amount and in which especially problems caused by secondary surface broke will be eliminated or at least minimised.

To achieve the above-mentioned objects and those which come out later, the method according to the invention is mainly characterised by what is presented in the characterising part of claim 1.

According to the invention, at least one two-sided tape is used for fastening a surface layer/surface layers of a web roll i.e. a machine roll in connection with a reel-up of a fibre-web machine. According to the invention in the method, for fastening the surface layer/surface layers of the web roll to the web roll being completed, at least one two-sided tape is adhered from its one side to the web being passed to the web roll being completed or to the surface of the web roll and, after that, the tape is adhered from its other side to the surface of the web roll being completed/to the surface of the web being reeled onto the web roll that is being completed due to the effect of a reeling nip between the reel drum and the web roll or a pressing-roll nip between the web roll and a pressing roll or due to the effect of the tightness of the web. According to the invention in the method, for fastening the surface layer/surface layers of the web roll to the web roll being completed, at least one two-sided tape is adhered in two stages between the web roll being completed and the web forming the surface layer of the web roll so that one side of said tape is first adhered to the web being passed to the web roll or to the surface of the web roll and, after that, the other side of said tape is adhered to the surface of the web roll or to the surface of the web being reeled to the web roll due to the effect of the reeling nip between the reel drum and the web roll or the pressing-roll nip between the web roll and the pressing roll or due to the effect of the tightness of the web.
The method according to the invention is applied in a reel-up of a fibre-web machine in a change of reeling of a web from a first web roll being completed on a first reeling shaft to a new, second web roll for reeling the second web roll around a second reeling shaft. The method comprises the step of fastening a tail of the web to an outer surface web layer of the first web roll and the further steps of:

- adhering a first side of at least one two-sided tape to an outer surface of a roll,
- passing the at least one two-sided tape with the outer surface of the roll to a first contact point formed between the roll and the web,
- adhering a second side, opposite to the first side of the at least one two-sided tape to the web in the first contact point, whereby the first side of the at least one two-sided tape detaches from the surface of the roll in the first contact point and the at least one two-sided tape continues to travel with the web,
- said first contact point being, in a first alternative, on the path of the web passing to the first web roll, whereas the at least one two-sided tape passes with a first surface of the web to a second contact point where the first surface of the web comes into contact with the outer surface web layer of the first roll, whereby the first side of the two-sided tape adheres to the outer surface web layer of the first web roll in the second contact point fastening the tail of the web to the outer surface web layer of the first web roll, or
- said first contact point being, in a second alternative, on the outer surface of the first web roll, whereas the at least one two-sided tape passes with the outer surface web layer of the first roll to the second contact point where the first surface of the web being passed to the first web roll comes into contact with the outer surface web layer of the first roll, whereby the first side of the two-sided tape adheres to the first side of the web being passed to the first web roll in the second contact point fastening the tail of the web to the outer surface web layer of the first web roll.
According to advantageous embodiments of the invention, the tape/tapes is/are fastened before the change to the surface of the reel/s shaft, i.e. reel spool or to a separate tape applicator roll positioned before the reel drum/machine roll, or to a pressing roll arranged in connection with the reel drum or the machine roll, from which the tape/tapes is/are adhered to the web being passed to the web roll being completed (or machine roll) or to the surface of the web roll being completed by means of a nip or by means of the tightening of the web. The tape/tapes may be detached from the surface of the reel/s shaft or the like and adhere to the tail of the web or to the surface of the web roll, whereby one adhesive surface of the two-sided tape/tapes adheres to the surface of the completed machine roll to the web being reeled onto the machine roll and fastens thus the surface layer/surface layers of the machine roll to prevent their loosening and/or for fastening the tail of the web to the web roll during braking and stopping of the machine roll.

In connection with the invention, the tape/tapes can be fastened before the change to the surface of the reel/s shaft either manually or by using a taping device. One can also grip the tape with a gripping device from its ends and transfer the tape above the web and drop it on the web, whereby the tape is carried along with the web and sticks to the web and the machine roll in the reel/s nip. Furthermore according to an embodiment, when using tag-like tapes the tapes can be guided by means of compressed air blows onto the surface of the web.

The tape/tapes is/are positioned on the surface of the reel/s shaft longitudinally, crosswise or spirally. The tape/tapes can be located in one or more points of the web in its width and length direction.

In connection with the tape, there can also be a releasable protective surface layer by release of which, e.g. by means of blowing, the tape can be timed to adhere to a desired point in the tail of the web. For example, when performing a water-cutting change in which the web is cut from the middle to the edges so that tails...
reminding dress-coat tails remain in the web on both cross-directional edges of the web, the release can be timed so that the tapes will be placed on the tails. Using a tape provided with protection, the protection is most advantageously connected to the tape so that the protection turns away from the tape because of adhesive but does not separate from it completely but is guided to the machine roll, in order for the protection not to fly loosely.

The adhesion to the web of the tape used in connection with the invention must be greater than its adhesion to the surface of the reeling shaft. This can be implemented by the choice of an adhesive material or by making the surface of the reeling shaft such that the adhesion of the tape to the surface of the reeling shaft is smaller than the adhesion of the tape to the web e.g. so that a shiny tape is fastened to the surface of the reeling shaft or a suitable material, such as plastic or teflon, is used as the coating material of the reeling shaft. The surface of the reeling shaft can also be made suitable in respect of its adhesion by grinding or by polishing or by other corresponding treatment decreasing adhesion force.

The two-sided tape used in connection with the invention can also be such that the adhesion on the side fastening to the surface of the reeling shaft is smaller than on the side first adhering to the web but so that the surface on the side of the reeling shaft has adequate adhesion for adhesion to the surface of the machine roll. The tape is fastened to the surface of the reeling shaft detachably and to the web and to the machine roll permanently. The adhesion of the tape must however be adequate in order for the tape not to detach from the surface of the reeling shaft before its fastening to the web e.g. because of air flows created when the reeling shaft rotates. The adhesion force of the tape (peeling adhesion 180° Tesa test method jopma 002) is advantageously greater than 0 N/cm² but smaller than 2 N/cm², most suitably 0.5–1.5 N/cm².

According to an advantageous embodiment of the invention, in applying the two-sided tape, the reeling shaft is brought into contact with the web by closing the
primary nip before the change, whereby the tape/tapes on the surface of the reel-
ing shaft comes/come into contact with the web and, because the adhesion to the
web is greater than to the surface of the reeling shaft, the tape is fastened, when
coming out of the nip, to the web and detached from the reeling shaft. The two-
sided tape goes with the web into the machine roll and binds the surface of the
machine roll when passing through the nip of the reel drum or the pressing roll
below the first surface layer of the machine roll. The fastening can also occur
without the nip solely due to the effect of the tightness of the web.

According to an advantageous additional characteristic of the invention, timing is
used in connection with applying the tape, whereby e.g. by delaying the change
moment it is possible to control the amount of web coming to the surface of the
machine roll on the tape/tapes.

According to an advantageous additional characteristic of the invention, the tape
is repulpable, whereby it is possible to use the surface layers of the machine roll
as broke. Such a tape is e.g. a splicing tape, known as such, used on unwinders.
E.g. packing tape is suitable for a possible tape to be positioned on the surface of
the reeling shaft.

According to an embodiment of the invention, one or more separate applications
are made i.e. in the completion stage of the roll the tapes are applied in respect of
time in different stages, whereby it is possible to bind the surface of the roll and to
leave layers required for sampling below the surface and a completed binding
below them for further storage or whereby it is possible to bind the full-width tail
of the web and after this the dress-coat tails formed in the water cutting.

When performing the fastening of the surface layers of the machine roll to the
machine roll according to the invention, an advantage is achieved, inter alia, that
the two-sided tape binds the surface layers durably, whereby the surface layers of
the machine roll cannot become loosened during the braking of the completed
machine roll or after it, whereby surface broke decreases and that the tail of the machine roll remains by means of the tape fastened to the surface of the machine roll, whereby the tail will not separate from the surface during braking and thus will not be able to hit a possible pressing device, whereby there occurs no problem with "flying pieces" or it is at least minimised.

When fastening the tail of the web to the surface of the machine roll with the tape according to the invention, surface layers are effectively held fast to the surface of the machine roll, whereby it is even possible to implement the braking of the completed machine roll without a pressing device, whereby considerable cost-savings is achieved.

When applying the invention in connection with a water-cutting change performed in reel-ups, according to advantageous additional characteristics, the tapes are fastened so that one tape takes care of the fastening of the tail of the web to the completed machine roll, tapes are further advantageously added to fasten the so-called dress-coat tails created in the water cutting to the surface of a completed machine roll. Then after closing the nip, the first tape passes with the web to the machine roll and additional tapes arranged by timing are detached from the reeling shaft and adhere to the dress-coat tails thus fastening them to the surface of the machine roll.

When applying the invention in connection with a gooseneck change performed in reel-ups, according to advantageous additional characteristics, the tape/tapes is/are positioned on the surface of the reeling shaft spirally as spirals extending from the middle to the edge. The cutting of the web is performed by a knife or by a corresponding cutting means which hits the tip of the spiral at a point from which the spiral extending from the tip towards the edges controls the slashing of the gooseneck into a wedge. Then, the spiral-like tape goes with the web to the surface of the machine roll and binds the end i.e. tail of the web and functions thus as a means binding the surface layers of the machine roll thus decreasing the creation
of secondary surface broke and the unreeling of the machine roll. If required, to the middle can be arranged an additional tape by means of which the head of the end of the web is lifted. The tape can also be a two-part tape which divides from the middle, whereby one part picks up the head and the other is separated with the tail and guided into the machine roll binding the surface layers of the roll.

The invention can also be applied to a change performed by change-blowing pipes placed below or by a full-width high-speed knife in a reel-up e.g. of OptiReel type in which before the change process the roll is pulled out of contact with the reel drum. In that case, the tape/tapes adheres/adhere to the web by means of the tightness of the web or by means of a pressing-device nip.

The invention will now be described in more detail with reference to the figures of the accompanying drawing, to the details of which the invention is, however, by no means intended to be narrowly confined.

Fig. 1 schematically shows a change arrangement of a machine roll according to an embodiment of the invention.

Fig. 2 shows an embodiment of the invention in which the tape is positioned in the longitudinal direction of the reeling shaft.

Fig. 3 schematically shows an embodiment of the invention in which the tapes are positioned in the cross-direction of the reeling shaft.

Figs. 4A–4B schematically show applying the invention in connection with a water-cutting change.

Figs. 5A–5B schematically show applying the invention in connection with a change made by a cutting blade.
Fig. 6 schematically shows applying the invention in connection with a nip open change.

5 Fig. 7 schematically shows applying the invention in connection with a gooseneck change.

Fig. 8 schematically shows some embodiments of the invention.

10 Fig. 9 schematically shows a further embodiment of the invention.

In the figures and the description related to them, the same references are used of parts corresponding each other if not otherwise stated.

15 In the arrangement according to Fig. 1, there is a web roll 11 i.e. a machine roll 11 being completed around a reeling shaft 10. A reel drum is designated with reference number 13 and, for manufacturing the next web roll for changing the reeling into a new roll, a new reeling shaft 12 is transferred to a stand-by position into connection with the reel drum 13. Arrows S1 and S2 show the direction of rotation of the machine roll 11 being completed and the direction of rotation of the reel drum 13 and arrow SW shows the travel direction of the web W. According to an advantageous embodiment of the invention, two-sided tape/two-sided tapes 20 is/are fastened to the surface of the new reeling shaft 12 brought to the stand-by position before its transfer to the stand-by position. The tape/tapes 20 is/are fastened before the change to the surface of the reeling shaft 12 manually or by using a taping device. From the surface of the reeling shaft 12, the tape/tapes adheres/adhere to the surface of the tail of the web W being guided onto the machine roll 11 being completed and, in the reeling nip between the reel drum 13 and the machine roll 11 being completed, the other side of the tape/tapes adheres to the surface of the machine roll 11, whereby the surface layers of the machine roll 11 become bound and they are not able to become loosened when, after the
cutting of the web W, the completed machine roll 11 is braked and stopped for transferring it for further processing. According to an advantageous additional characteristic of the invention, on the surface of the new reeling shaft 12 there can also be a tape/tapes which adheres/adhere to the web W timed so that it/they is/are positioned on the part of the web W being guided into connection with the new reeling shaft 12.

Fig. 2 shows an embodiment of the invention in which the tape 20 is positioned in the longitudinal direction on the surface of the reeling shaft 12. The tape 20 is two-sided and of its adhesion such that its adhesion to the reeling shaft 12 is smaller than to the web. In the embodiment shown in Fig. 2, a bottom tape 21 is used on the surface of the reeling shaft under the tape 20 by means of which bottom tape the adhesion of the tape 20 is arranged to be smaller on the side of the reeling shaft than on the side of the web W.

Fig. 3 schematically shows an embodiment of the invention in which the tapes 20 are positioned in the cross-direction on the reeling shaft 12. Also in the embodiment of this figure, under the tapes 20 there is the bottom tape 21.

Figs. 4A–4B schematically show applying the invention in connection with a water-cutting change, in which the tapes 20 are fastened so that one tape 20A takes care of the fastening of the tail of the web W to the completed machine roll, one tape 20B picks up the head of the web W and fastens it to the reeling shaft and tapes 20C are further advantageously added to fasten the so-called dress-coat tails F created in the water cutting to the surface of the completed machine roll. Then after closing the nip, the first tape 20A passes with the web W to the machine roll and, e.g. by blowing, the head of the web W having the second tape 20B is guided into connection with the new reeling shaft 12 and likewise the protections of the tapes 20C are opened by blowing in a timed manner, whereby the tapes 20C adhere to the dress-coat tails F thus fastening them to the surface of the machine roll.
Figs. 5A–5B schematically show applying the invention in connection with a change made by a cutting blade. In Figs. 5A–5B, a cutting line C is marked by a dashed line on the web W, which line is made by a cutting blade in a known manner for cutting the web W. The two-sided tape/two-sided tapes 20 is/are fastened according to the invention to the tail of the web W being guided onto the completed machine roll, which tape/tapes fastens/fasten the tail of the web W to the surface of the completed machine roll thus fastening the surface layers of the machine roll. In Fig. 5A, two tapes are fastened to the tail of the web W in the edge areas of the web W and, in Fig. 5B, one tape 20 extending over the substantial cross-directional width of the web W is fastened to the tail of the web W.

Fig. 6 schematically shows applying the invention in connection with a nip open change in which the web roll 11 i.e. the machine roll 11 is being completed around the reeling shaft 10. The reel drum is designated with reference number 13 and, for manufacturing the next web roll for changing the reeling into a new roll, the new reeling shaft 12 is transferred to a stand-by position into connection with the reel drum 13. Arrows S1 and S2 show the direction of rotation of the machine roll 11 being completed and the direction of rotation of the reel drum 13 and arrow SW shows the travel direction of the web W. In connection with the machine roll 11 being completed, there is a pressing roll 14 for pressing the surface layers during braking and stopping. According to an advantageous embodiment of the invention, the two-sided tape/two-sided tapes 20 is/are fastened to the surface of the new reeling shaft 12 brought to the stand-by position before its transfer to the stand-by position. From the surface of the reeling shaft 12, the tape/tapes adheres/adhere to the tail of the web W being guided onto a machine roll 11 being completed and, due to the effect of the nip of the pressing roll 14, the other side of the tape/tapes adheres to the surface of the machine roll 11, whereby the surface layers of the machine roll 11 become bound and they are not able to become loosened when, after the cutting of the web W, the
completed machine roll 11 is braked and stopped for transferring it for further processing. When applying the arrangement according to the invention, the use of the pressing roll 14 can be omitted, whereby the tape 20 makes the web W adhere to the surface of the machine roll 11 due to the effect of prevailing web tightness T. On the other hand according to an embodiment of the invention, the tape 20 can be adhered to the machine roll by means of the pressing roll 14 as is marked in the figure for an alternative applying embodiment D of the tape. In this embodiment, the tape/tapes 20 is/are fastened to the pressing roll 14 in a manner corresponding to that described above in connection with the feeding shaft 12, the pressing roll 14 being in the stand-by position before its transfer to a surface-binding position in which it forms a pressing device nip with the machine roll 11.

Fig. 7 schematically shows applying the invention in connection with a gooseneck change in which the tape/tapes 20 are positioned on the surface of the feeding shaft 12 spirally as spirals extending from the middle to the edge. The cutting of the web is performed by a knife 25 or a corresponding cutting means which hits the tip of the spiral at a point from which the spiral extending from the tip towards the edges controls the ripping of the gooseneck into a wedge. Then, the spiral-like tape goes with the web onto the surface of the machine roll and binds the end i.e. tail of the web and functions thus as a means binding the surface layers of the machine roll thus decreasing the creation of secondary surface broke and the loosening of the surface layers of the machine roll. If required, to the middle can be arranged an additional tape 22 by means of which the head of the end of the web is lifted. The tape can also be a two-part tape which divides from the middle, whereby one part picks up the head and the other is separated with the tail and guided into the machine roll, binding the surface layers of the roll.

According to alternative embodiments A, B, C shown in Fig. 8, the tape/tapes 20 can also be fastened in manners corresponding to the afore-described embodiments to a separate tape applicator roll 19B positioned before the reel drum 13/machine roll 11, e.g. to a segmented roll 19B positioned on the side of the web W as...
the reel drum 13 or the reeling shaft 12, or to a pressing roll 19A positioned on the reel drum 13 from the surface of which the tape/tapes 20 is/are caused to adhere to the tail of the web W being guided onto the machine roll 11. These embodiments are advantageous especially in situations in which the nip between the new reeling shaft 12 and the reel drum 13 is open.

According to an embodiment shown in Fig. 9, the tape 20 can be transferred between the web W and the surface of the machine roll 11 by means of a reeling nip, whereby the tape is transferred into the vicinity of the nip e.g. by a binding device (not shown in the figures) arranged into connection with the reel-up, is dropped on the web, arrow S20, whereby the tape 20 is guided with the web W into the reeling nip e.g. by means of blowings and adheres to the web and to the machine roll in the reeling nip.

The invention has been described above mostly related to reel-ups in which the reeling nip is formed between the reel drum and the roll being formed. The method according to the invention is also applicable in reel-ups in which e.g. a support fabric, e.g. a belt, passes over the reel drum through the reeling nip, between the reel drum and the roll being formed, which is described e.g. in FI patent 94231. The invention is also applicable in reel-ups in which the reeling nip is formed between a support fabric, e.g. a belt, and the roll being formed, which is described e.g. in FI patent application 970610.

The invention has been described above only referring to some of its advantageous embodiments, to the details of which the invention is, however, by no means intended to be narrowly confined.
Claims

1. A method in a reel-up of a fibre-web machine, said method being applied in a change of reeling of a web (W) from a first web roll (11) being completed on a first reeling shaft (10) to a new, second web roll for reeling the second web roll around a second reeling shaft (12), said method comprising the step of fastening a tail of the web (W) to an outer surface web layer of the first web roll (11), characterised by the steps of:

- adhering a first side of at least one two-sided tape (20) to an outer surface of a roll (12, 14, 19A, 19B),

- passing the at least one two-sided tape (20) with the outer surface of the roll (12, 14, 19A, 19B) to a first contact point formed between the roll (12, 14, 10A, 19B) and the web (W),

- adhering a second side, opposite to the first side of the at least one two-sided tape (20) to the web (W) in the first contact point, whereby the first side of the at least one two-sided tape (20) detaches from the surface of the roll (12, 14, 19A, 19B) in the first contact point and the at least one two-sided tape (20) continues to travel with the web (W),

- said first contact point being, in a first alternative, on the path of the web (W) passing to the first web roll (11), whereas the at least one two sided tape (20) passes with a first surface of the web (W) to a second contact point where the first surface of the web (W) comes into contact with the outer surface web layer of the first roll (11), whereby the first side of the two-sided tape (20) adheres to the outer surface web layer of the first web roll (11) in the second contact point fastening the tail of the web (W) to the outer surface web layer of the first web roll (11), or

- said first contact point being, in a second alternative, on the outer surface of the first web roll (11), whereas the at least one two-sided tape (20) passes with the outer surface web layer of the first roll (11) to the second contact point where the first surface of the web (W) being passed to the first web roll (11) comes into contact with the outer surface web layer of the first roll (11), whereby the
first side of the two-sided tape (20) adheres to the first side of the web (W) being passed to the first web roll (11) in the second contact point fastening the tail of the web (W) to the outer surface web layer of the first web roll (11).

2. A method according to claim 1, characterised in that said first contact point is, in the first alternative, formed between the second reeling shaft (12) and the reel drum (13), the web (W) passing to the first web roll (11) being passed through said first contact point, whereby the at least one two-sided tape (20) detaches from the outer surface of the second reeling shaft (12) and passes with the web (W) to the second contact point where the first surface of the web (W) being passed to the first web roll (11) comes into contact with the outer surface web layer of the first web roll (11) and the first side of the at least one two sided tape (20) adheres to the outer surface web layer of the first web roll (11).

3. A method according to claim 1, characterised in that said first contact point is, in the first alternative, formed between a tape applicator roll (19B) and a counter roll, the web (W) passing to the first web roll (11) being passed through said first contact point, whereby the at least one two-sided tape (20) detaches from the outer surface of the tape applicator roll (19B) and passes with the web (W) to the second contact point where the first surface of the web (W) being passed to the first web roll (11) comes into contact with the outer surface web layer of the first web roll (11) and the first side of the at least one two sided tape (20) adheres to the outer surface web layer of the first web roll (11).

4. A method according to claim 1, characterised in that said first contact point is, in the first alternative, formed between a first pressing roll (19A) and the reel drum (13), the web passing to the first web roll (11) being passed through said first contact point, whereby the at least one two-sided tape (20) detaches from the outer surface of the first pressing roll (19A) and passes with the web (W) to the second contact point where the first surface of the web (W) being passed to the first web roll (11) comes into contact with the outer surface web layer of the first
web roll (11) and the first side of the at least one two sided tape (20) adheres to the outer surface web layer of the first web roll (11).

5. A method according to claim 1, characterised in that said first contact point is, in the second alternative, formed between a second pressing roll (14) and the outer surface of the first web roll (11), whereby the at least one two-sided tape (20) detaches from the outer surface of the second pressing roll (14) and passes with the outer surface web layer of the first web roll (11) to a second contact point where the outer surface web layer of the first web roll (11) comes into contact with a first surface of the web (W) being passed to the first web roll (11) and the first side of the at least one two-sided tape (20) adheres to the first surface of the web (W) being passed to the first web roll (11).

6. A method according to any one of the preceding claims, characterised in that the adhesion between the outer surface of the reeling shaft (12) or the second pressing roll (14) or the first pressing roll (19A) or the tape applicator roll (19B) and the at least one two-sided tape (20) is chosen to be smaller than the adhesion between the web (W) and the at least one two-sided tape (20).

7. A method according to any one of the preceding claims, characterised in that the at least one two-sided tape (20) has an adhesion to the web (W) in the range of 0–10 N/cm², advantageously in the range of 0.5–1.5 N/cm².

8. A method according to any one of the preceding claims, characterised in that the at least one two-sided tape (20) is positioned so that it adheres to the web (W), extending over a substantial cross-directional width of the web (W) in relation to the travel direction of the web (W).

9. A method according to any one of the preceding claims, characterised in that the at least one two-sided tape (20) is positioned so that it adheres to the web (W),
extending over a substantial length of the web (W) in the travel direction of the web (W).

10. A method according to any one of the preceding claims, characterised in that the at least one two-sided tape (20) is positioned so that it adheres to the web (W), extending askew in relation to the travel direction of the web (W).

11. A method according to any one of the preceding claims, characterised in that in a water-cutting change performed in a reel-up, at least two two-sided tapes (20A, 20C) are used so that at least one tape (20A) binds the tail of the web (W) to the outer surface of the first web roll (11) and at least one tape (20C) binds the “dress-coat tails” (F) created in the water cutting to the outer surface of the first web roll (11).
FIG. 3

FIG. 4A